

REMARKS

The Applicant again reminds the Examiner that the present invention is related to the control of a laser so that noise is substantially reduced. As more fully described in the specification, the laser involved is utilized in a data storage system and is driven by a laser driver in order to accommodate the writing and reading of information to an optical storage disk. The laser driver, by its nature, is required to vary the current to the laser in order to produce the laser signals (optical signals) required for its operation. Consequently, this requires a very dynamic operating environment. In such an environment, the present invention provides the advantage of eliminating a noise floor existing in the laser signal, resulting in fewer problems and errors during operation. The inventors have discovered that a portion of this noise could easily be canceled by providing an appropriate feedback circuit, which creates a noise reduction signal. This noise reduction signal is then provided directly to the laser and operates to cancel noise.

Rejections Under 35 U.S.C. § 102(b)

Again, claims 1-39 have been rejected under 35 U.S.C. § 102(b). More specifically, the Examiner rejected the claims as being anticipated by *Kaneko et al.* (U.S. Patent No. 5,471,449). As further outlined below, the '449 patent is directed towards an entirely different device and does not include all of the limitations contained in claims 1-39. Consequently, this rejection is inappropriate and should be removed.

As opposed to the Examiner's interpretation of the '449 patent, a close examination reveals a much different concept and system is being contemplated therein. The '449 patent is directed towards the blanking of certain sectors on the media when defects are detected. See, '449 patent, col. 2, lines 30-39. This has nothing to do with noise reduction in the laser system, as does the present invention. Referring to the details of the '449 patent, it is noteworthy that the photo detector cited by the Examiner is simply the readout detector of an optical storage system. See *Id.*, col. 3, line 67 – col. 4, line 1. Such a detector is used to read data and, as such, is used for detecting an optical signal after it has been reflected off the media. *Id.*

In looking at this readout signal, many noise sources may exist, all possibly unrelated to the actual laser itself. Consequently, the readout could not be used to produce a reliable signal which can be used for the noise reduction functions contemplated by the present invention.

The output from the readout of the '449 patent is then provided to a filter and subsequently a level detector. *Id.*, col. 4, lines 1-7. If the filtered readout signal is sufficiently high (suggesting a defect in the media), subsequent systems are activated to overwrite that section of the media, thus preventing its further use in storing data. *Id.*, col. 4, lines 18-47.

While the invention of the '449 patent is interesting, it is not related to the noise reduction concept claimed in the present application. Specifically, the '449 patent does not refine the operation of the laser to reduce noise in the produced optical signal. Even more specifically, the system of the '449 patent does not create a noise reduction signal which is combined with the laser driver signal. Also the '449 patent does not have an optical sensor which receives the optical signal (laser signal) directly from the laser via a beam splitter. For these reasons, the '449 patent does not anticipate claims 1-39 of the present application. Further, the teaching of the '449 patent is so unrelated to the claimed invention, it cannot form the basis for a rejection under any relevant sections of the patent laws.

Rejections Under 35 U.S.C. § 112

Claims 1-39 were also rejected under 35 U.S.C. § 112 as being indefinite. Based upon claim modifications outlined above, and following remarks, the Applicant submits that this rejection is also inappropriate and requests allowance of the present claims.

The Examiner had rejected claims 1 and 32 as being vague, confusing and indefinite because these claims: are not clear as to how the laser driver and control system operate "in conjunction" with one another; are not clear regarding whether the laser driver and laser are part of the noise control system; fail to provide a clear structure as shown in Figure 1; and are not clear regarding how the filter element and feedback network are configured to provide noise control for the noise control system. Each of these issues are addressed individually below.

In the specification, the laser noise control system and laser driver cooperation can easily be seen by referencing any one of Figures 1-4. In each case, the laser driver 14 includes an output signal which is provided to laser 12. A second connection 64, or a feedback network output 64, is also connected to the input of laser 12. Additionally, the claims have been modified to more clearly describe this function, each of these components provide a signal to the laser, and thus jointly operate in conjunction with one another. Consequently, the Applicant respectfully disagrees with the Examiner's comment and requests that related rejection be removed.

Referring now to the preamble of both claims 1 and 32, the relationship between the laser noise control system and the laser driver of the present invention can easily be understood. Based upon this recitation, it is obvious that the laser driver and laser are not part of the laser noise control system. The laser noise control system itself provides an additional signal which, when combined with the laser driver signal achieves the goal of the present invention by reducing noise.

As mentioned above, the Examiner had commented that the claims do not provide a clear illustration of the structure as shown in Figure 1. Certain amendments have been made to the claims, including the addition of a beam splitter which directly receives the laser signal and provides a portion of that signal to the sensor of the laser noise control system. This is consistent with the structure shown in Figure 1.

Lastly, the Examiner indicated that was not clear how the filter element and feedback element are configured to provide a noise control system. Once again, the Applicant disagrees with the Examiner's comment. The feedback network itself includes a filtering capability, which results in the production of a noise reduction signal over the desired frequency band. As is well recognized by those skilled in the art, this filtering capability, and production of the appropriate noise reduction signal, could be achieved via various pieces of circuitry. The various figures and embodiments described in the specification illustrates some options for these circuits. Consequently, there is sufficient structure shown and claims 1 and 32 should be allowed.

In addition to the issues discussed above, rejections to various claims were made because of their failure to specifically recite switch 70. The Examiner indicated that the switch appears to hold a key part of noise feedback. While switch 70 does provide a capability which enhances operation, it is not an essential element of the invention. The Examiner correctly realizes that the switch does provide one interesting feature, but must also recognize that certain circumstances may exist where the switch is not necessary. For example, if a optical drive does not have write capabilities (i.e. a read only, or ROM drive), the switch 70 would be unnecessary. Consequently, switch 70 is appropriately claimed in certain dependent claims, but does not appear in other claims. The Examiner's rejection based on the failure to claim the switch is wholly inappropriate and should also be removed.

For the reasons stated above, the Applicant respectfully submits that all pending claims are allowable. The Commissioner is hereby authorized to charge or credit any amount to our Deposit Account No. 50-1901.

Should the Examiner have any questions regarding the above referenced comments and or amendments, it is respectfully requested that the undersigned be contacted via telephone to expeditiously deal with any issues.

Respectfully submitted,

By 

Craig J. Lervick, Reg. No. 35,244

Attorney for Applicant

Oppenheimer Wolff & Donnelly LLP

45 South Seventh Street, Suite 3300

Minneapolis, MN 55402-1609

Telephone: (612) 607-7387